Pre-Amp Gain Ratio Test

CU Boulder Test Stand
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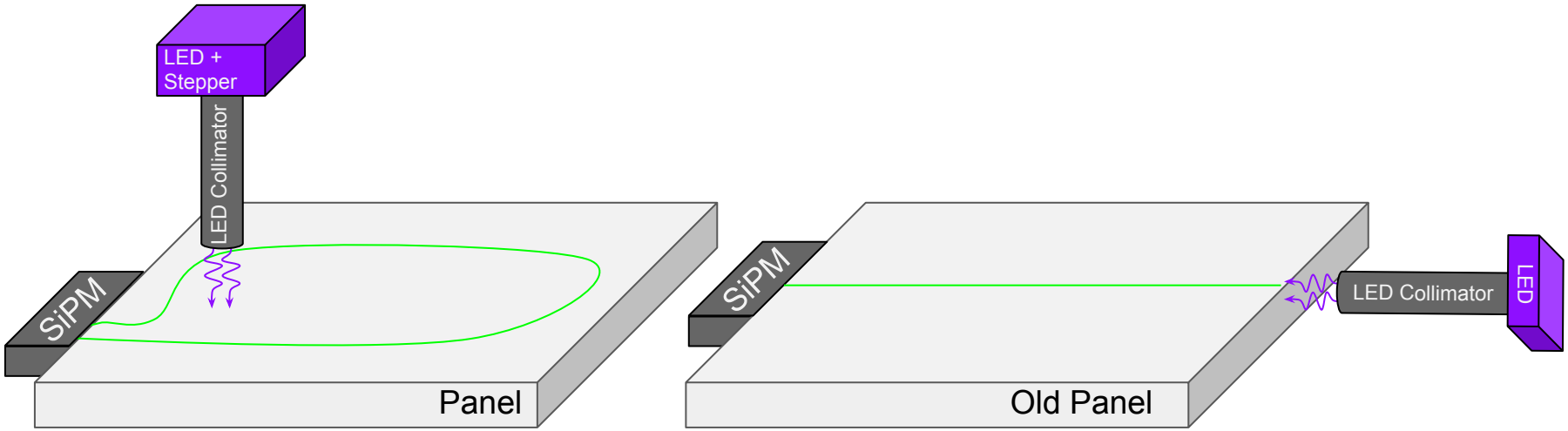
Experimental SetUp

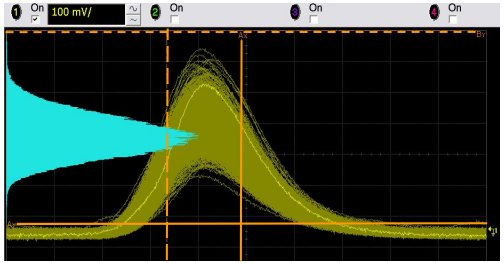


This is current setup. It is the same as that used for the LED position scans, however In the actual experimental setup, the fiber is on the opposite side of the panel as the LED. Here they are drawn on the same to show their relative alignments.

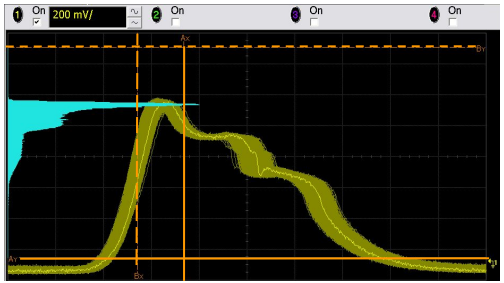
This is not the current setup, but the test stand could be modified to easily look like this. The advantage of a setup like this is that for this set up, the primary source of the light is the LED, as such any complications introduced by the light passing through the panel are avoided.

DAQ Method

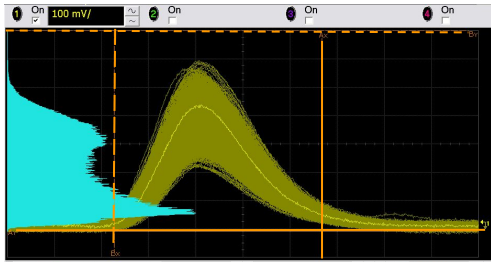
Typical distribution for an unwarped pulse. Note the histogram window width (given by the orange lines).



A distribution for a warped pulse (1300mV bias). Note the histogram window had to be moved back in time to capture the pulse peak.



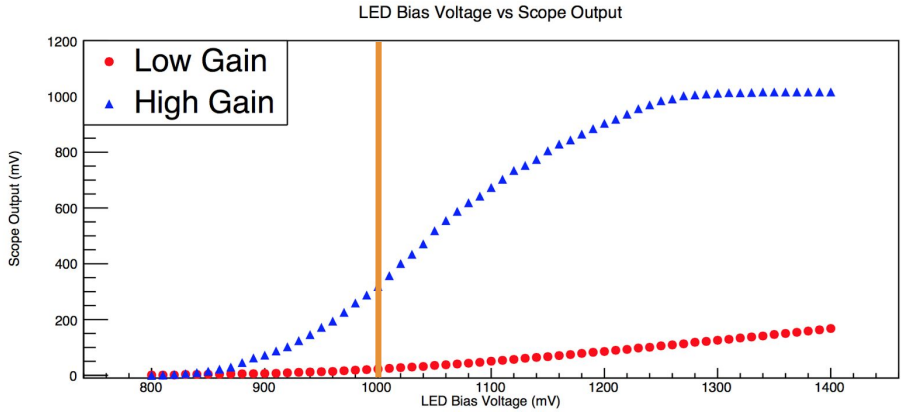
Typical distribution for an unwarped pulse now including the full waveform (not the standard procedure)

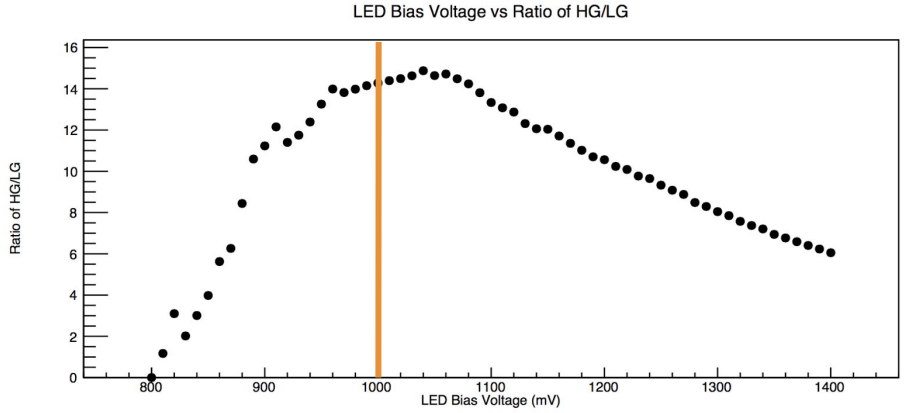


- Single LED (405 nm) firing at approximately 1 MHz
- Trigger off function generator
- Use histogram scope function to create a distribution of pulse heights to capture the pre-amp's Vout distribution
- Use scope markers to manually select the mean of the histogram distribution
- Record mean Vout for high and low gain settings as a function of LED bias

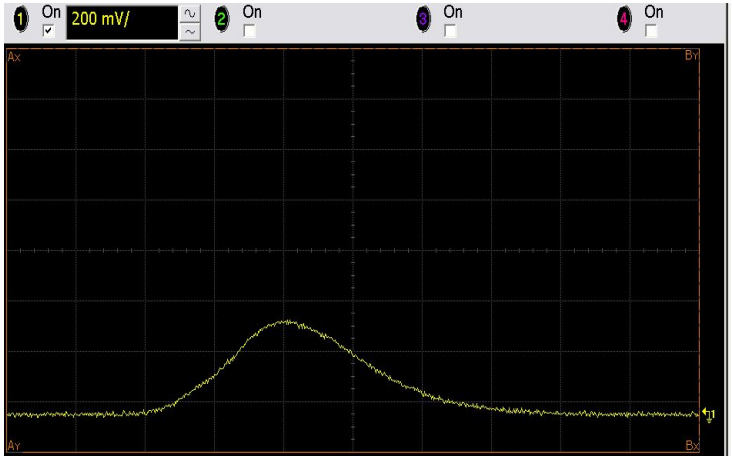
- The scope's histogram function creates a histogram by projecting the waveform within a window selected by the user onto the y axis.
- I select a window about a small region to either side of the signal peak, to ensure that the peak voltages are the primary source of the histogram distribution.

A Normal Pulse in Low and High Gain

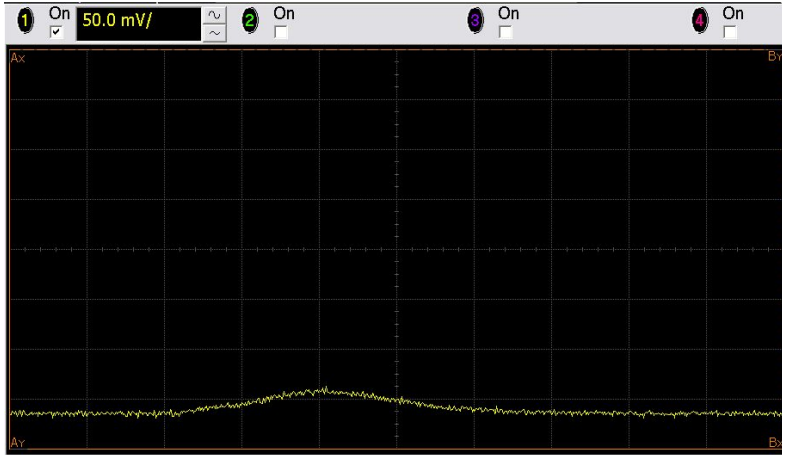




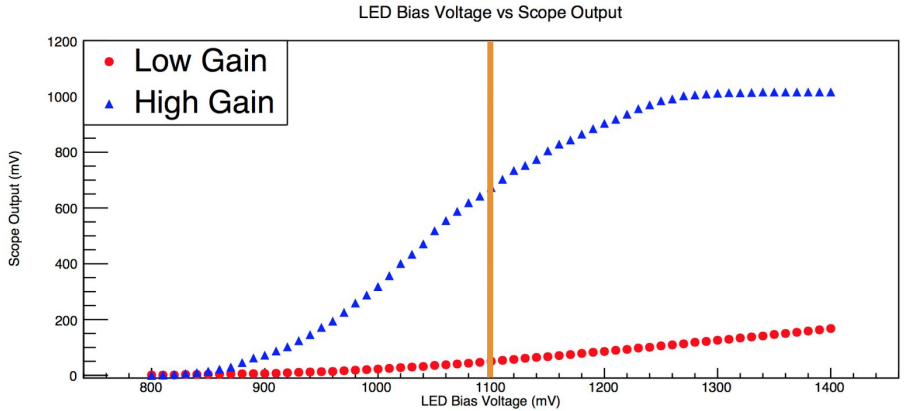
High Gain pulse corresponding to 1000 mV

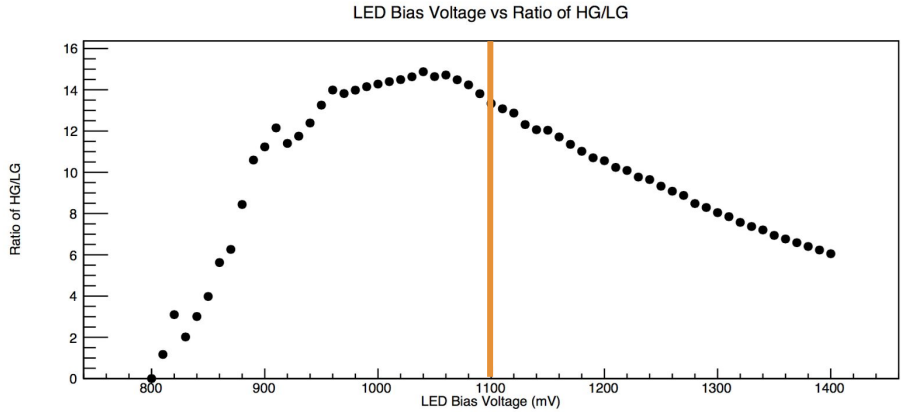


Low Gain pulse corresponding to 1000 mV

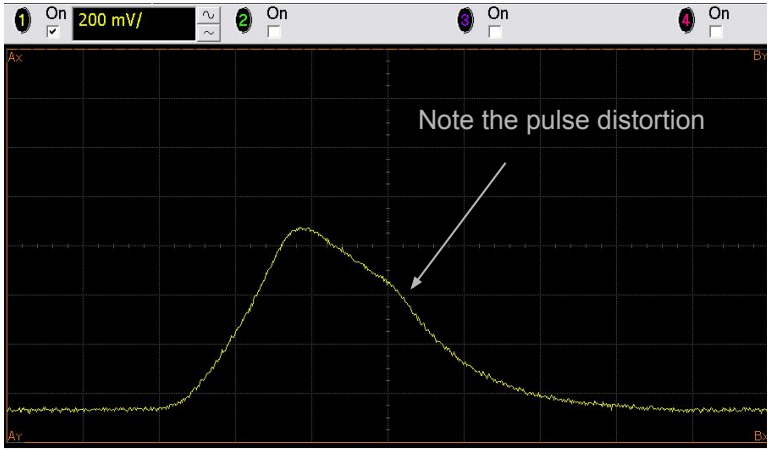


Distortion Forming in High Gain Pulse

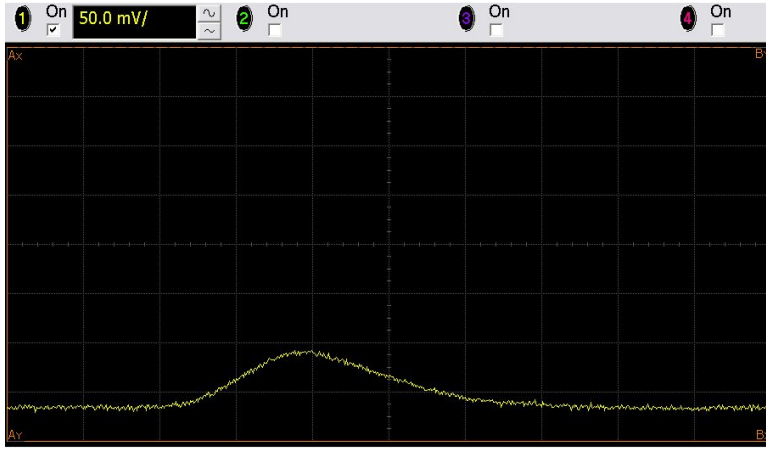




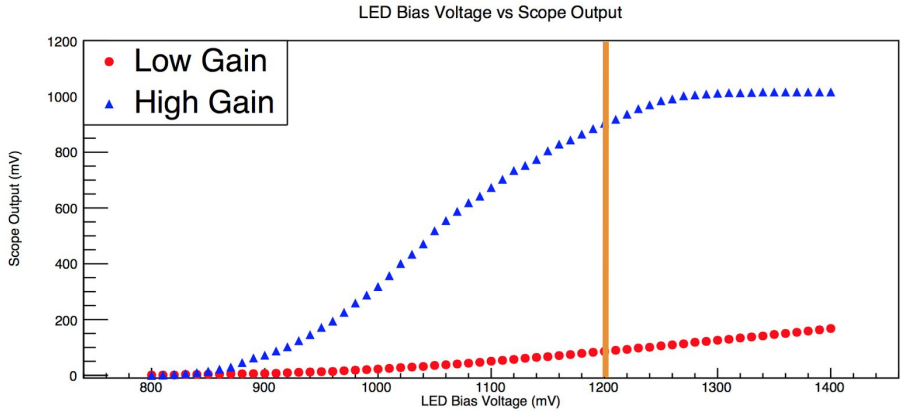
High Gain pulse corresponding to 1100 mV

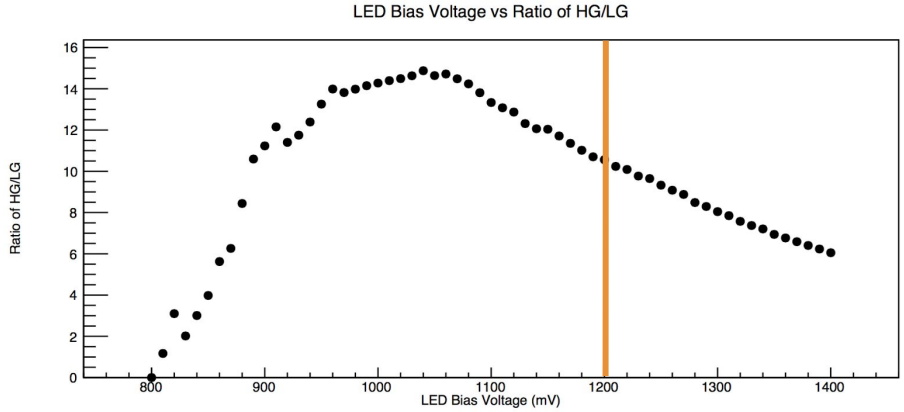


Low Gain pulse corresponding to 1100 mV

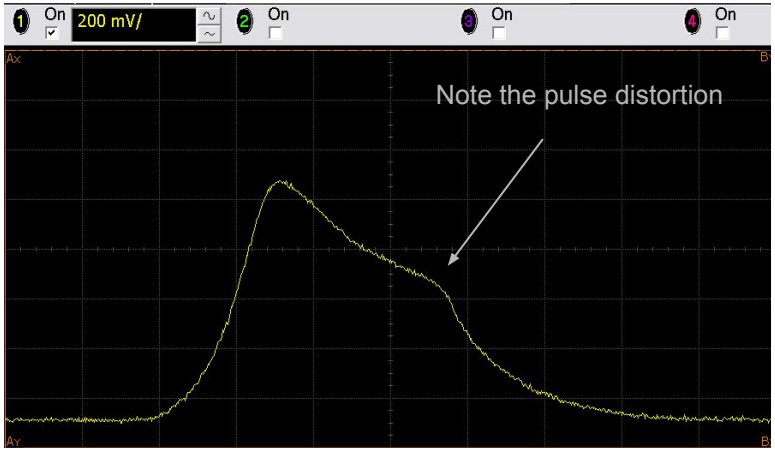


Distortion Evolving in High Gain Pulse

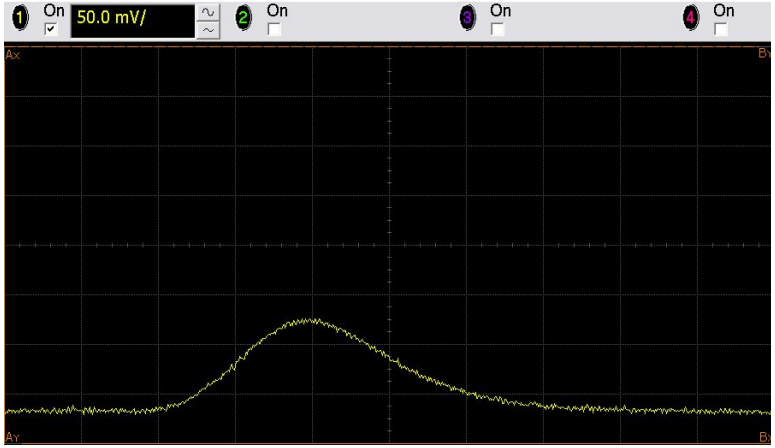




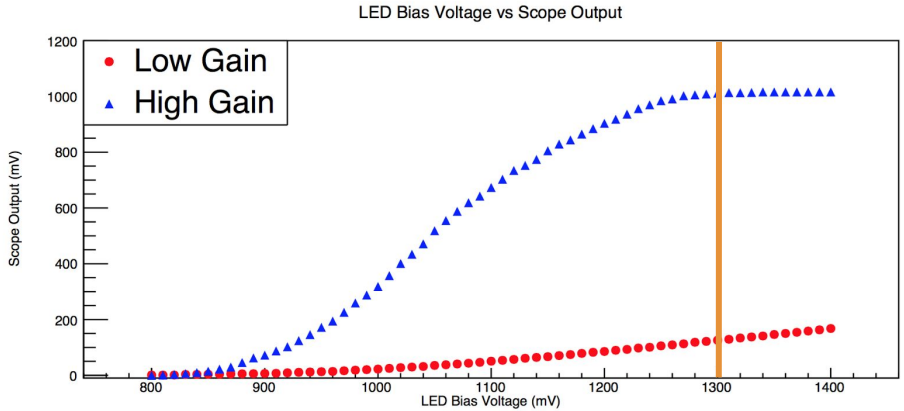
High Gain pulse corresponding to 1200 mV

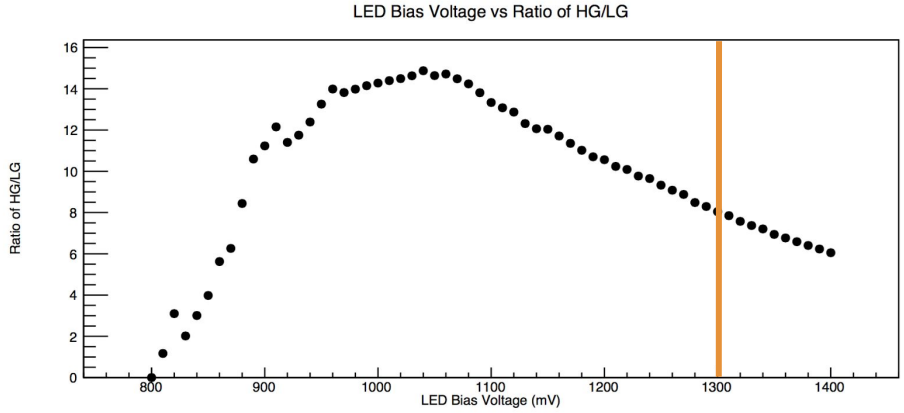


Low Gain pulse corresponding to 1200 mV

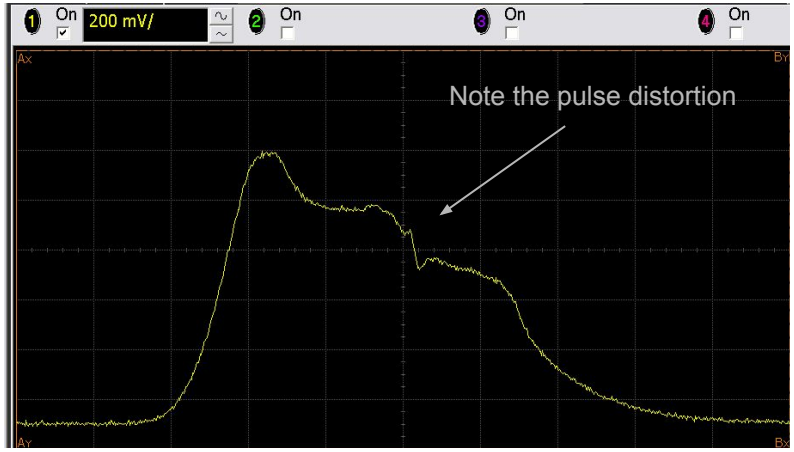


Distortion Evolving in High Gain Pulse

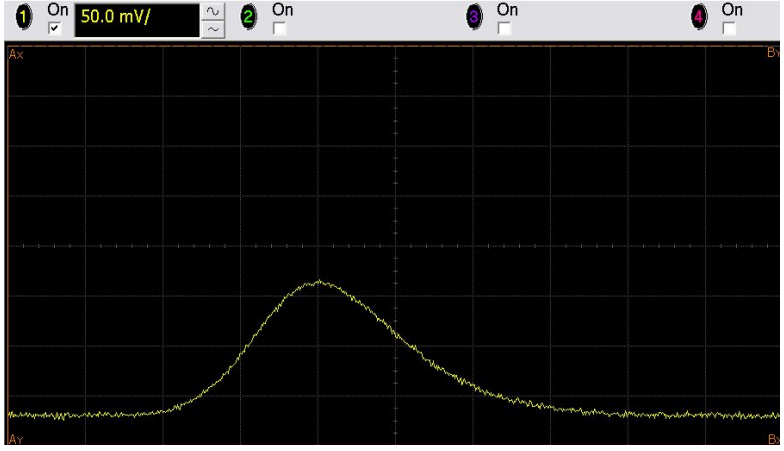




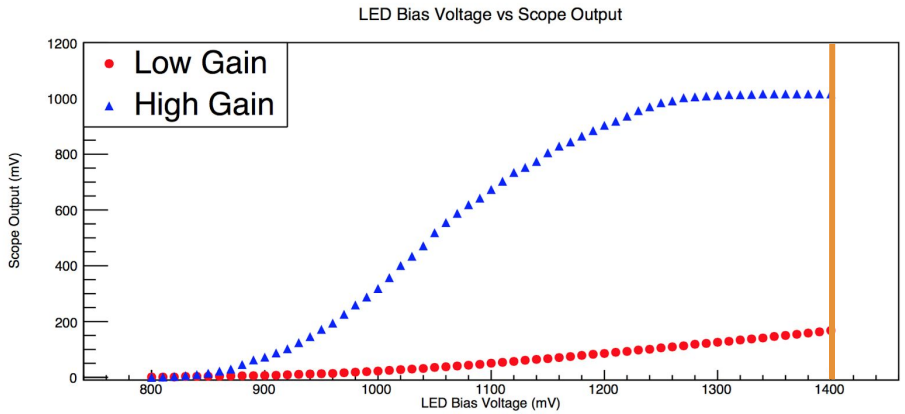
High Gain pulse corresponding to 1300 mV

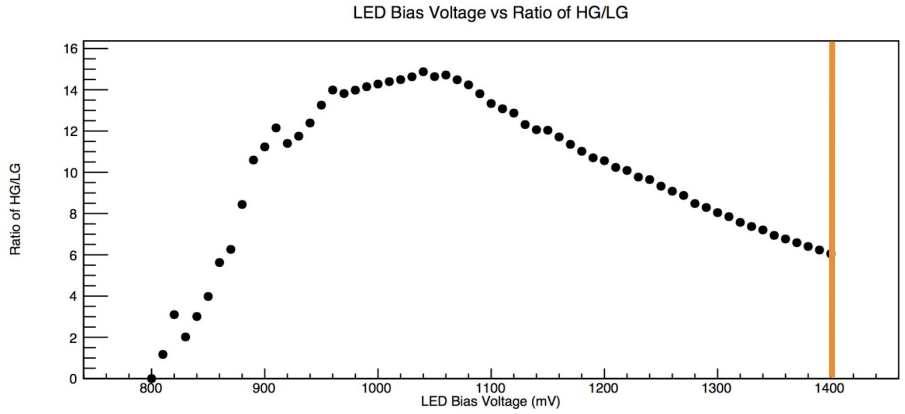


Low Gain pulse corresponding to 1300 mV

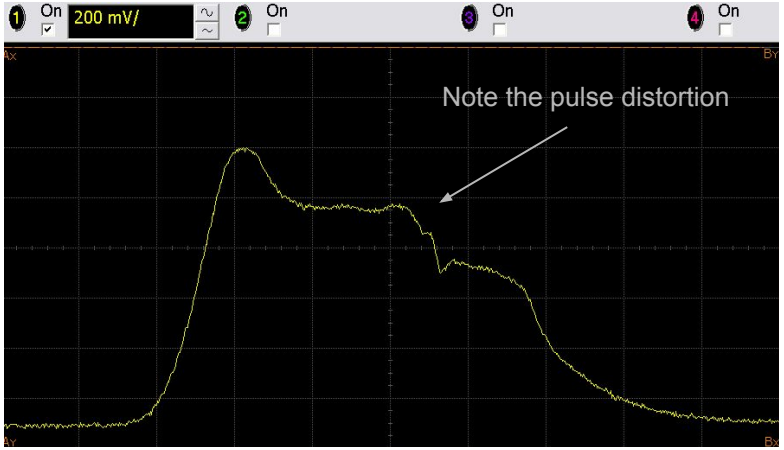


Final Distortion at Low Gain Saturation





High Gain pulse corresponding to 1400 mV



Low Gain pulse corresponding to 1400 mV